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18-MEMBERED MACROCYCLES AND
ANALOGS THEREOFCROSS-REFERENCE TO RELATED
APPLICATIONS

The present application is a continuation-in-part application of International Application PCT/US2005/002887 filed Jan. 31, 2005, and claims priority to U.S. Provisional Application No. 60/570,697 filed May 14, 2004, each application of which is incorporated by reference in its entirety.

FIELD OF INVENTION

The present invention relates generally to the 18-membered macrocyclic antimicrobial agents called Tiacumicins, specifically, the R-Tiacumicin B or Tiacumicin B and its related compounds. In particular, substantially pure R-Tiacumicin B, as a potent antibiotic agent for the treatment of bacterial infections, specifically GI infections caused by toxin producing strains of *Clostridium difficile* (*C. difficile*), *Staphylococcus aureus* (*S. aureus*) including methicillin-resistant *Staphylococcus aureus* (MRSA) and *Clostridium perfringens* (*C. perfringens*).

BACKGROUND OF THE INVENTION

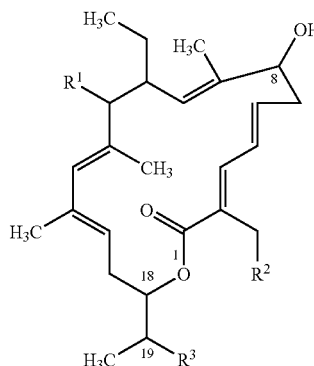
Macrocycles are an important therapeutic class of antibiotics. These compounds are frequently produced as a family of closely related biogenetic congeners. The Tiacumicins are a series of 18-membered macrocyclic antibiotics in which the

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macrocyclic ring is glycosidically attached to one or two sugars. A seven-carbon sugar is esterified at various positions with small fatty acids. The other sugar, when present, is esterified with an isomer of the fully substituted benzoic acid, everninic acid. (Journal of Liquid Chromatography, 1988, 11: 191-201).

Tiacumicins are a family of related compounds that contain the 18-membered ring shown in Formula I below.

Formula I



At present, several distinct Tiacumicins have been identified and six of these (Tiacumicin A-F) are defined by their particular pattern of substituents R¹, R², and R³ (U.S. Pat. No. 4,918,174; J. Antibiotics, 1987, 40: 575-588), as shown in Table 1.

TABLE 1

Substituents Present In Tiacumicins A-F			
	R ¹	R ²	R ³
A		H	H
B			OH
C			OH